DOCUMENT RESUME

ED 455 432 CE 082 094

TITLE	A Vision of E-Learning for America's Workforce: Report of the Commission on Technology and Adult Learning.
INSTITUTION	American Society for Training and Development, Alexandria, VA.; National Governors' Association, Washington, DC. Center for Best Practices.
PUB DATE	2001-06-00
NOTE	32p.
AVAILABLE FROM	For full text: http://www.astd.org/virtual_community/public_policy/jh_ver.pdf.
PUB TYPE	Opinion Papers (120)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS.
DESCRIPTORS	Access to Computers; Access to Education; Adult Education; *Adult Learning; Certification; Change Strategies; *Computer Uses in Education; Cooperative Planning; Definitions; Delivery Systems; Distance Education; Economic Factors; Economic Impact; *Education Work Relationship; Educational Change; Educational Cooperation; Educational Needs; Educational Quality; *Educational Technology; Educational Trends; Employer Attitudes; *Equal Education; *Futures (of Society); Lifelong Learning; Needs Assessment; Online Courses; Partnerships in Education; Performance Based Assessment; Position Papers; Postsecondary Education; Private Sector; Program Development; Program Evaluation; Public Sector; School Business Relationship; Student Evaluation; Systems Approach; Trend Analysis
IDENTIFIERS	American Society for Training and Development; Task Force Approach; *Technology Based Instruction

ABSTRACT

In 2000, the American Society for Training and Development and the National Governors Association convened the Commission on Technology and Adult Learning. The 31-member commission included representatives of the business, government, and education sectors. They formulated a vision for the future of e-learning in the United States and identified the actions needed to make that vision come to life. After defining e-learning as instructional content or learning experiences delivered or enabled by electronic technology, the commission made the economic case for e-learning and emphasized e-learning's potential to broaden access to high-quality education and training opportunities and thereby boost income growth at all levels. The commission presented a vision of a future where e-learning allows learning to become a continuous process of inquiry and improvement that keeps pace with the speed of change in business in society. The commission called for public and private sector leaders to work together to accomplish the following actions: (1) create the highest-quality e-learning experiences possible; (2) implement new measures and methods for assessing and certifying what individuals know and are able to do; and (3) ensure broad and equitable access to e-learning opportunities. The commission also presented 13 recommendations regarding quality, assessment and certification, and access. (Contains 14 endnotes.) (MN)

ED 455 432

A Vision of **E-Learning** for America's **Workforce**

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Report of the Commission on Technology and Adult Learning

ASTD
Linking People, Learning & Performance

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Introduction and Overview

In 2000, the American Society for Training and Development (ASTD) and the National Governors Association (NGA) convened the Commission on Technology and Adult Learning. Its mission: *to define and encourage a technology-enabled learning environment that will result in an engaged citizenry and a skilled workforce for the digital economy.*

With the broad participation of leaders from business, government and education, the Commission set out to establish a vision for America's e-learning future while outlining the actions needed to make this vision come to life. The Commission's recommendations for action, which are included in this report, are directed to the nation's governors and corporate CEOs, two groups the Commission believes will play an essential role in tapping e-learning's potential as a cornerstone of individual, organizational and community success.

The Stakes for CEOs. For CEOs and their organizations, e-learning holds the potential of contributing to significant gains in worker skills, productivity and performance. E-learning also can deliver significant cost savings when compared to traditional types of corporate training. Equally important, e-learning can provide access to high-quality training content from countless sources throughout the world. This, in turn, can lead to improvements in individual and organizational performance.

The Stakes for Governors. For governors, e-learning's promise rests in its potential as a driver of value-added economic growth. By opening the door to dramatic boosts in business performance, productivity and the number of skilled workers, e-learning can play an essential role in economic development initiatives at all levels. E-learning also can broaden opportunities for skill development and employment in high-quality jobs for all segments of the population, contributing to income growth, improved lives for Americans, and a more informed and contributing citizenry.

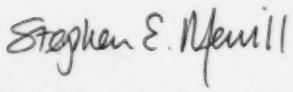
Questions for the Future

Just as e-learning presents a number of opportunities for individuals, organizations and society, it also poses some serious questions for the future, including:

- How do we ensure consumer protection and high-quality learning in an open e-learning environment?
- In a learner-centered system, what is the best way to assess what individuals are actually learning? How can we best certify learning results?
- And how do we promote equitable access to the technologies and the high-quality learning content that play a vital role in the success of e-learning?

These are the key questions that the Commission on Technology and Adult Learning seeks to answer in this report—both by presenting a vision of America's e-learning future and by making specific recommendations for action.

We extend our sincere appreciation to our fellow Commissioners, as well as the staffs at ASTD and NGA, for their important work over the past year. With the help of e-learning, we can build a workforce with the knowledge, the skills, the ability and the passion to learn that are essential to success in the digital economy of the 21st century.



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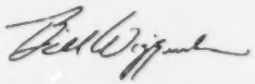

A. William Wiggenhorn
President, Motorola University
Commission Co-chair

June 2001

Executive Summary

Recent technological advances have laid the foundation for a learning revolution that will clearly take place in the years ahead. The Commission on Technology and Adult Learning believes that e-learning will play a vitally important role in equipping workers with the skills they need to succeed in the 21st-century digital economy.

What Is E-Learning? E-learning can be defined as instructional content or learning experiences delivered or enabled by electronic technology. The Commission on Technology and Adult Learning has focused its attention on adult-centered and work-related e-learning—that is, technology-enabled learning designed to increase workers' knowledge and skills so they can be more productive, find and keep high-quality jobs, advance in their careers, and have a positive impact on the success of their employers, their families and their communities.

E-learning has the potential to revolutionize the basic tenets of learning by making it individual- rather than institution-based, eliminating clock-hour measures in favor of performance and outcome measures, and emphasizing customized learning solutions over generic, one-size-fits-all instruction. It is this transformational potential of e-learning that the Commission believes America must recognize and embrace in the years ahead.

Making the Case for E-Learning. The economic case for building a successful e-learning future hinges in part on the efficiency of e-learning and its role in shortening the amount of time it takes to get workers up to speed on new products and processes. Improvements in the quality of education and training are an equally important economic benefit of e-learning, which offers potentially universal access to best-in-class learning content, as well as a wide variety of content available anywhere in the world. E-learning also holds enormous potential as a tool for reducing the costs of workplace-related education and training.

Economic reasons, however, are not the only justification for aggressively supporting e-learning. At a time when many Americans express concern about growing economic disparities among different segments of the population, e-learning holds the potential to broaden access to high-quality education and training opportunities and, in turn, boost income growth at all levels.

A Vision of America's E-Learning Future. The Commission on Technology and Adult Learning foresees a future in which e-learning allows learning to become a continuous process of inquiry and improvement that keeps pace with the speed of change in business and society. With e-learning, the learner has convenient, just-in-time access to needed knowledge and information, with small content objects assembled and delivered according to the learner's specific needs.

The Commission foresees increased reliance on new means of assessing and certifying learning results that emphasize individual skills and knowledge rather than courses taken or credit hours earned. We also see the continued rise of an e-learning market based on common technical standards, "open design" and the widespread sharing of information across states and sectors about successful and innovative approaches.

This vision of e-learning is evolving at a fast pace. By acting together now, government, business and education have the opportunity to shape America's e-learning future.

ACHIEVING THE VISION: RECOMMENDATIONS FOR ACTION

Achieving the Commission's Vision of E-Learning for America's Workforce calls for concerted action by both the public and private sectors. The Commission has identified three priority areas for action in the months and years ahead, focusing on the critical issues of quality, assessment and certification, and access. We have developed one broad recommendation in each of these issue areas (see below), as well as more specific recommendations that are presented on page 6 and discussed in more detail later in the report.

The Commission on Technology and Adult Learning calls on public and private sector leaders to work together to:

1. **Create the highest-quality e-learning experiences possible.** Rapid growth in such areas as distance learning, technology-enabled assessment, and the increasingly diversified and expanded public-private adult learning marketplace requires us to develop new strategies for assuring quality and protecting consumers. Important priorities for the public and private sectors include: providing reliable and universally accessible quality information for consumers; developing quality assurance mechanisms; ensuring that learners have the support they need to make the right decisions about their e-learning options; and developing policies and practices to ensure privacy.

2. **Implement new measures and methods for assessing and certifying what individuals know and are able to do.** Traditional, institution-based approaches to assessment and certification are not well suited to an e-learning world in which the focus turns from a record of classes taken and degrees received to measures of what an individual actually knows and is able to do. As a result, private and public sector leaders need to take steps to create new approaches such as: developing and promoting outcome-based assessments of learning results; and creating an electronic system for tracking those results.

3. **Ensure broad and equitable access to e-learning opportunities.** In areas from supporting the development of common technical standards to promoting broader access in underserved communities, government and business must play a leadership role in making quality e-learning opportunities more widely available to all. The challenge and the opportunity are the same: to realize e-learning's potential for reducing the divide between the "haves" and "have nots" in America today.

As government and business leaders set out to undertake these activities, they can rest assured that the potential return on investment for both the public and private sectors is enormous. The challenge for businesses is to realize the full potential of e-learning as a driver of productivity and performance gains by making it an integral part of organizational strategy and operations. For government, the challenge is to create a nurturing policy environment for e-learning—first, by removing barriers that restrict access to e-learning's benefits and, second, by promoting industry self-regulation while balancing citizens' interests and needs.

THE RECOMMENDATIONS

Quality

- Promote a greater emphasis on outcomes to assure the quality of e-learning.
- Establish public-private partnerships to conduct research and development on how adults learn and how to measure learning.
- Provide reliable and universally accessible consumer information about the quality of e-learning content, services and providers.
- Enhance the abilities and skills of educators to create and deliver high-quality e-learning.
- Develop policies and practices to ensure the privacy of information about individuals' work performance and learning outcomes.

6

Assessment and Certification

- Develop and promote outcome-based measures of what people know and are able to do.
- Develop fair and reliable assessment and certification methods.
- Create a universal and widely accessible electronic system that allows individuals and organizations to document learners' knowledge and skills.

Access

- Adopt common technical standards aimed at promoting open and equitable access while reducing development costs.
- Create conditions that favor e-learning and eliminate barriers that inhibit people from engaging in e-learning.
- Provide incentives and foster public-private partnerships to promote broader access to e-learning among underserved communities.
- Provide leadership in demonstrating the power of e-learning for individuals and communities.
- Use the "bully pulpit" to speak out on behalf of e-learning.

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Technology and the Learning Revolution

The 21st-century economy places a premium on innovation, customization, new business models, and new ways of organizing work. In order to succeed—and even survive—in this new environment, individuals and organizations must continually acquire new skills and new ways of managing knowledge and information. Just as technology is driving many of the revolutionary changes that are occurring in the world of work, it also holds the potential of helping people and organizations keep pace with change. Technology—and, more specifically, e-learning—opens the door to a learning revolution that could help to create unprecedented opportunity, productivity and prosperity in the years ahead.

THE E-LEARNING UNIVERSE

- Distance learning
- CD-ROMs
- Videoconferencing
- Computer-based instruction
- Satellite downlinks
- Interactive TV lectures
- Computerized diagnostic assessment & evaluation
- Competency certification
- Electronic portfolios
- Virtual educational networks
- Corporate universities
- Communities of learners
- Group- and project-based learning technologies
- And much more....

(For a complete glossary of e-learning concepts and terms, see www.learningcircuits.org/glossary.html.)

What Is E-Learning?

E-learning can be defined as instructional content or learning experiences delivered or enabled by electronic technology. Functionally, e-learning can include a wide variety of learning strategies and technologies, from CD-ROMs and computer-based instruction to videoconferencing, satellite-delivered learning and virtual educational networks. In other words, it is not just Web-based instruction or distance learning but includes many ways in which individuals exchange information and gain knowledge.

For the purposes of this report, e-learning is *adult-centered* and *work-related.* More broadly, it is technology-enabled learning that is designed to increase workers' knowledge and skills so they can be more productive, find and keep high-quality jobs, advance in their careers, and have a positive impact on the success of their employers, their families and their communities.

Why Should Governors and CEOs Care?

Governors and CEOs should care about e-learning because of the very real and quantifiable benefits it can deliver for individuals, organizations and society as a whole. E-learning has the potential to play a critical role in equipping workers with the skills they need to succeed in the digital economy—and, in turn, boost economic competitiveness and growth.

Today's job market places a premium on higher levels of skills and knowledge. Eighty-five percent of new jobs require education beyond high school, up from 65 percent in 1991.[1] And yet, employers across the country are having trouble finding the highly educated, highly skilled workers they need. A recent American Management Association survey found that nearly four out of every ten job applicants tested for basic skills by U.S. corporations in 1999 lacked the necessary reading, writing and math skills to do the jobs they sought.

E-learning has the potential to help reduce the skills gap that continues to stand in the way of individual and organizational success. And, by promoting speed, accessibility and an environment for continuous learning, e-learning can help workers keep pace with today's rapidly changing business and work environments.

As strong as the potential of e-learning is, it is neither a quick nor an easy fix for longtime educational and societal problems. Insuring the quality of e-learning and developing new content and systems takes time and money. Furthermore, while technology provides new opportunities to make learning a more integral part of Americans' work and lives, technology cannot do this on its own. Reaping the true benefit of e-learning for our citizens, our economy and our democracy will require changing societal attitudes and broader educational policies and practices that have resisted reform.

METATRENDS: E-LEARNING AND MICROTIZATION

"Microtization" is a word often used to describe the trend of computers and other technology to become ever-smaller. But the term also applies to the bits of information that drive learning. As work-related tasks become more specialized, so too does the information a worker needs to complete those tasks successfully. The best kind of learning in this environment is learning that combines small, interchangeable bits of information to assemble personalized learning content.

Technology accelerates and makes affordable the process of customizing learning by making it possible to store, re-use and re-combine these "learning objects." However, the trend toward microtization and specialization creates a need to establish new methods of assessment and certification that are focused on single skills in addition to broad skill sets. It also means that the public and private sectors must work together to provide learners with the support they need to make the right decisions about their e-learning options.

What Makes E-Learning Different?

It can emphasize solutions and learning results. A gradual transformation is under way in today's workplaces, one in which "training" is giving way to "learning solutions." This transformation is based on the fact that in an e-learning environment, access to just-in-time infor-

mation, advice and performance support are as central to learning as the traditional classroom event was for earlier generations. The e-learning experience is based on the recognition that technology offers the opportunity to integrate learning with work in order to enhance performance in a dynamic, interactive and measurable way.

It is learner-focused. Technology can personalize content and anticipate learners' future information and learning needs by recognizing patterns in how people learn. It also can match content with each individual's learning style, experience and skills.

Personal electronic "tutors" can offer different pathways (sound, virtual depictions, alternative explanations) to help learners grasp what was not clear the first time around. And visualization technologies enable instructors and learning content providers to model and present many different kinds of information in dynamic ways that help people learn more rapidly and effectively by doing rather than observing. Flight simulators, for example, allow student pilots to learn to fly in dangerous weather conditions without risk and with the benefit of advice from experienced aviators.

In addition, by creating communities of learners, e-learning can help people share information in both formal and informal ways.

It can happen anytime and anywhere. In contrast to traditional forms of work-related learning that require participation in specific courses at specific times and locations, e-learning can take place anytime and anywhere—and from any source. One important benefit is that e-learning allows learning to take place at the worksite and in the context of an individual's job responsibilities. This enables learners and organizations to tailor learning to workers' unique needs, interests and schedules.

At the same time, e-learning's "anytime, anywhere" approach places different responsibilities on the individual learner, who must now be able to find, analyze, integrate, store and retrieve information in new and more self-directed ways. In an e-learning environment, individuals also must take added responsibility for keeping their skills up to date.

It creates new models for the provision of learning. The demand for greater customization of information and learning, together with technology's role in meeting this demand, increasingly removes the intermediary in transactions between producers of information and the individual user. This can make it easier to reach a larger audience. Technology also can help break down the barriers of space and time and offer unprecedented access to opportunities for information sharing and peer-to-peer learning.

E-learning changes the traditional business model for education, which relies on physical plant, professors and curricula, libraries and laboratories. One result is that at least some of the core capabilities of post-secondary institutions are likely to be disaggregated and provided by new businesses.

Another consequence of these emerging learning models is that new strategies for promoting and protecting investments in research, writing and other forms of intellectual property will be required in the more competitive and fluid learning environment of the future. E-learning also creates a need for new and different ways of measuring the quality of learning. New credentials that validate what an individual knows and is able to do are already beginning to challenge traditional certifications based on courses taken and credits earned.

BY THE NUMBERS: A STATISTICAL PORTRAIT OF E-LEARNING TODAY

The combination of rapid-fire technological advances and trends such as globalization, changing demographics and the need for higher-level skills in today's knowledge-based economy has nurtured an emerging e-learning marketplace that is primed for explosive growth in the years ahead. The following statistics show what the e-learning marketplace looks like today, as well as what the future holds for this rapidly growing segment of the U.S. economy.

Corporate e-learning in the United States is a $1.2 billion market and is expected to grow to *a $7 billion market by 2003.*[1]

The global e-learning industry comprises approximately 5,000 suppliers offering every imaginable method of e-learning. The vast majority of these suppliers are private; no single competitor in the e-training market accounts for 5 percent market share or more—a fact that is contributing to growing market consolidation.[2]

According to ASTD's *State of the Industry Report 2001*, firms participating in the organization's Benchmarking Service projected a 117-percent increase, on average, in the use of learning technologies between 1999 and 2002. ASTD found that the percentage of organizations using the Internet for training purposes grew from 3 percent in 1996 to 38 percent in 1999. For intranets, the rate of growth was even higher, from 3.5 percent to nearly 40 percent.[4]

A recent survey by International Data Corporation affirmed the *growing popularity of the World Wide Web* as a training medium. Web-based training, according to the survey, is expected to surge by more than 900 percent between 1999 and 2003. A key reason, according to a *Business Week* report on the findings, is that "online training is far cheaper than bringing in a live instructor, let alone sending employees to an offsite training location. And productivity doesn't suffer as much when employees get their how-tos at their own computers."[5]

A remarkable *84 percent of two- and four-year colleges in the United States expect to offer distance learning courses in 2002*, according to the Department of Education. In 1998, only 58 percent of colleges reported offering these courses.[6]

The *percentage of post-secondary students enrolled in distance education is expected to triple* from just 5 percent in 1998 to 15 percent in 2002.[7]

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The Case for E-Learning

Building a successful e-learning future should be a priority for both the public and private sectors because doing so can contribute to both economic *and* social progress. One of the most important benefits that can accompany a commitment to e-learning is a large-scale boost in the quality of the learning opportunities available to American workers.

The Economic Case. The economic case for forcefully addressing this issue hinges on the dynamic relationship that links e-learning, the individual learner and organizational performance. Simply put, people can learn more efficiently through e-learning—in large part because it makes learning more personalized and more accessible. Numerous studies have shown that workers learn faster with multimedia training; they more accurately recall what they learned over a longer period of time; and they are better able to transfer what they learned to actual performance. Enhancing the quality of e-learning so that these benefits are more widely available is thus a vitally important priority for the years ahead.

AN E-LEARNING FUTURE MEANS...

- Higher-quality education and training
- Improved business efficiency and performance
- A more competitive workforce
- Greater equality of opportunity
- Increased levels of literacy
- Stronger families and communities

High-quality e-learning creates an economic advantage for both individuals and organizations by improving "speed to capability"—or shortening the amount of time it takes to get workers up to speed on new products and processes. As *Fortune Magazine* put it, "Training that used to take 6 to 9 months will be compressed to just 2 to 3 weeks, thus assuring faster time-to-market with products, and greater productivity."[8] This creates a strong economic incentive for the business community to embrace e-learning.

E-learning also offers potentially universal access to best-in-class learning content, as well as a wide variety of content available anywhere in the world. This, in turn, opens doors to dramatic gains in economic performance for individuals and organizations everywhere.

In addition to quality and performance improvements, e-learning holds enormous potential as a tool for reducing the costs of workplace-related education and training. Once the up-front infrastructure and development costs are met, the marginal cost of serving additional students is close to zero. At technology giant Cisco, e-learning programs in manufacturing have resulted in savings of $1 million per quarter thanks

to improved processes, as well as an 80-percent increase in speed to competence.[9]

Evidence of the economic promise of e-learning comes in the results of a 1999 report by W.R. Hambrecht + Co. Corporate e-learning, according to the report, is one of the fastest growing and most promising markets in the education industry today. "Technology-based training solutions are changing the way corporations deliver training in nearly all segments of the business process," the report states.[10] It continues:

> *". . . corporations save between 50–70 percent when replacing instructor-led training with electronic content delivery. Opting for e-training also means that courses can be pared into shorter sessions and spread out over several days so that the business would not lose an employee for entire days at a time. Workers can also improve productivity and use their own time more efficiently, as they no longer need to travel or fight rush-hour traffic to get to a class."*[11]

Once again, however, these benefits will only be available on a wide scale if the public and private sectors engage in good-faith efforts to improve the quality of e-learning.

The Social Case. The social case for e-learning is equally compelling. At a time when many Americans express concern about growing economic disparities among different segments of the population, e-learning holds the potential to broaden access to high-quality education and training opportunities. This, in turn, can boost income growth while nurturing a contributing citizenry.

More than 90 million Americans have low levels of literacy and are therefore unable to meet the needs of the changing workplace, according to the 1999 U.S. Department of Commerce report, *21st Century Skills for 21st Century Jobs.*[12] E-learning can play a crucial role in bridging skill, education and income gaps by making high-quality learning experiences more widely available and by tailoring them to individual workers' needs.

Not only will an expanded commitment to e-learning help people obtain and keep jobs, but it also will equip them to meet the needs of their families and communities. E-learning can help to strengthen democracy and community by broadening access to the information people need to improve their lives and the lives of those around them.

E-learning, of course, is not a panacea for America's social and economic challenges. Rather, it can and must be an integral part of a larger system of practices and policies crafted to broaden access to the opportunities our society offers.

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A Vision of E-Learning

Early in its work, the Commission on Technology and Adult Learning recognized the importance of creating a broad vision of e-learning for America's workforce. The vision,

WE ENVISION AN E-LEARNING FUTURE FOR

Learning is geared to the needs and interests of the individual learner and is integrated into virtually all aspects of the individual's work and life.

Control of the learning process shifts from institutions to individuals, who assume greater responsibility for developing their skills and knowledge.

Technology that supports e-learning makes it possible to customize and personalize content and delivery to match individuals' learning styles, experience and skills.

Learning is a continuous process of inquiry that keeps pace with the speed of change in business and society, rather than generic instruction based on set curricula.

New means of assessing and certifying learning results replace traditional, clock-hour measures, providing secure and reliable systems for recording and capturing what an individual knows and is able to do.

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for America's Workforce

printed below, is intended as a statement of what a best-case e-learning environment would look like, and how it would impact individuals, organizations and communities.

AMERICA'S WORKFORCE IN WHICH...

An "open design process" allows individuals to take full advantage of a borderless, technology-rich delivery environment and access high-quality learning content.

Cross-state and cross-sector partnerships assure the proper level of investment in, and attention to, promoting new learning strategies, taking successful practices to scale, and accelerating the speed of needed changes.

Information about successful and innovative e-learning practices is widely shared and informs the development and implementation of new programs and policies.

E-learning is driven by market forces, including individual decision-making and consumer choice, rather than by institutional interests.

E-learning is embedded in a system of other practices and policies designed to broaden individual opportunity and increase economic competitiveness.

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Achieving the Vision:

RECOMMENDATIONS FOR ACTION

Achieving the Commission's Vision of E-Learning for America's Workforce calls for concerted action by both the public and private sectors, as well as individuals and entire communities. Governors and corporate CEOs have a unique opportunity to provide leadership on this issue in the months and years ahead.

The Commission has identified three priority areas for action. Because the e-learning environment is evolving rapidly, these priorities are likely to evolve with it. The following is our current best judgment of the necessary actions that will bring all of us closer to realizing the true potential of e-learning in our society.

The enormity of the challenge makes a collaborative approach the only route to building our e-learning future. Therefore, we call on private and public sector leaders to work together to:

1. **Create the highest-quality e-learning experiences possible.**
2. **Implement new measures and methods for assessing and certifying what individuals know and are able to do.**
3. **Ensure broad and equitable access to e-learning opportunities.**

The following pages explain each of these recommendations in more detail, along with instructive examples of how various public and private organizations are beginning to address these issues.

RECOMMENDATION ONE:

Create the highest-quality e-learning experiences possible.

Indiana's Web-Based Child Care Learning Initiative

The state of Indiana's Family and Social Services Administration is working with an array of partners to deliver high-quality, college credit, Web-based instruction to child care providers throughout the state. The initiative responds directly to a common struggle facing child care providers across the country: finding the time and the means to take advantage of ongoing education and certification opportunities. Indiana's Child Care Learning initiative offers Web-based Child Development Associate (CDA) credential courses to providers in areas with limited or no access to ongoing education. (www.IN.gov/childcarelearning)

Assuring the future quality of adult learning must be a priority as government and business work together to build America's e-learning future. In particular, rapid growth in such areas as distance learning, technology-enabled assessment, and the larger public-private adult learning marketplace requires us to develop new strategies for assuring quality and protecting consumers.

What is high-quality e-learning? It is an e-learning experience that provides just the right content at just the right time, helps learners master needed knowledge and skills, and draws people in so they are motivated to learn and to apply their learning to improve individual and organizational performance.

Today, most of our quality assurance processes in adult learning are geographically rooted and focused on institutional providers. These processes are costly and slow; their metrics are rooted in utilization and completion rates rather than the added value or outcomes resulting from learning. As a result, the existing quality assurance system is not well suited to the dynamic, performance-focused, modular and borderless world of technology-enabled adult learning that is beginning to transform how people learn.

ASTD's E-Learning Certification Initiative

Recognizing that the availability of dependable quality standards is vital to the health and credibility of the new e-learning industry, The American Society for Training and Development (ASTD) launched a new initiative to certify Web-based and multimedia courses in June 2001. Through a legally independent entity, ASTD evaluates the instructional design and usability of various e-learning offerings. Course publishers pay a fee to have their courses reviewed for certification, and the list of certified courses is made available to users free of charge. An important goal of this effort is to contribute to improvements in the overall quality of e-learning. (www.astd.org)

Technology is making possible a whole new set of information, advisement, assessment and instructional services while reducing the cost of entry into the market. However, the proliferation of services and the disaggregation of such functions as content development and delivery may discourage future investment and continuing research and development unless government and business develop new strategies for protecting intellectual property. In addition, while savvy consumers are benefiting from the many

choices available through the free market, others need help finding the information, services and providers that can best meet their needs. Therefore, we call on private and public sector leaders to:

- **Promote a greater emphasis on outcomes to assure the quality of e-learning.** A variety of forces are working together to require the redesign of today's accreditation-based quality assurance systems. These forces include: the increasingly global nature of e-learning; the ongoing blurring of the lines between traditional educational institutions and new providers; and growing competition to create courses and other educational services and to develop new ways to distribute knowledge to an international student body. In response to these forces, leaders in business, education and government should work together to promote a greater emphasis on outcomes in accreditation and develop new mechanisms for quality assurance that can be broadly applied in a borderless and technology-rich learning environment. Providing information about what works must be a priority for all stakeholders because doing so will drive continuous improvements in performance and quality. At the same time, expanded access to information will allow individuals to take more responsibility for their own learning and career development.

- **Establish public-private partnerships to conduct research and development on how adults learn and how to measure learning.** Because e-learning is a still-emerging field, our understanding of what works and what does not remains limited. Government and the private sector should invest in research and development aimed at furthering our understanding of best practices in technology-enabled content, delivery and service approaches that are both individualized and cognitively sound. Other R&D priorities should include: investigating the ways in which the infusion of technology is having the greatest impact on adult learning; and identifying social and cultural supports that enhance learning in a technology-enabled environment.

Public-private partnerships can play an important part in promoting widespread adoption of programs that R&D efforts reveal as particularly successful, especially in cases where traditional education has failed. The goal of R&D efforts would be to identify key factors in the success of e-learning.

Michigan Virtual University

Michigan Virtual University (MVU) acts as a broker to identify and offer the state's best academic and technical courses remotely. Sixteen participating colleges offer 124 course titles to nearly 2,000 students through MVU. In addition, all 28 Michigan public community colleges are participating as "home" colleges, providing support for participating students from their areas. (www.mivu.org/index.asp)

New Jersey's Consumer Report Card

The State of New Jersey developed a "Consumer Report Card" to provide easy access to performance information on training programs so consumers can make informed choices about how to "spend" their individual training account (ITA) resources. When the system is fully operational, report card data will include the number of individuals completing the program; those receiving a license, credential or certificate; the average wage at placement; and wages over time. In addition to providing a direct benefit to consumers, the report card system will be used to evaluate providers against performance standards. (www.njtrainingproviders.org and http://wnjpin.state.nj.us/OneStopCareerCenter/SETC/index.html)

- **Provide reliable and universally accessible consumer information about the quality of e-learning content, services and providers.** Technology offers an array of new tools for promoting quality, accountability and competition among e-learning providers. These tools allow the aggregation of information on customer satisfaction and performance from multiple perspectives in multiple groups. This information then can be customized to individual needs. In order to ensure that individuals and organizations have a complete picture of the quality of the services offered, government should require providers to report learner outcomes and customer satisfaction information. As a first step toward needed changes, government and business should invest in and evaluate effective learning portals that provide easily accessible, reliable consumer information and guidelines for finding quality content, services and providers in the e-learning marketplace. The ultimate goal should be to direct learners, employers and others to proven e-learning initiatives.

- **Enhance the abilities and skills of educators to create and deliver high-quality e-learning.** E-learning creates an expanded role for educators as facilitators of educational experiences and resources for learners, rather than as outright providers of learning. In an e-learning environment, educators must have a detailed understanding of various technologies, comprehensive knowledge about available content and service providers, and the support skills that are critical to facilitating learners' success. Government and the private sector should provide leadership in professional development for the new adult learning environment by increasing awareness and understanding of effective technology-enabled teaching and learning methods among providers.

University of Maryland University College (UMUC)
Established in 1996, the distance learning initiative at UMUC places strong emphasis on faculty training for teaching in the virtual world. All professors who teach online are required to take a five-week training course that includes training in such issues as developing projects online and learning to use available software. One goal of the initiative is to help faculty use the Internet to create "class solidarity" in an environment where students are located in numerous locations and time zones. (www.umuc.edu/gen/virtuniv.html)

- **Develop policies and practices to ensure the privacy of information about individuals' work performance and learning outcomes.** As the experiences of individuals and teams increasingly can be captured through recording and analysis of their performance, government and business face new challenges in securing the privacy and security of personal information. Powerful profiling information on learners can be used by individuals, teams and organizations alike for credentialing, knowledge and skill inventories, hiring, compensation, and mapping an individual's learning needs with learning content. However, the potential value of this information for the individual and the employer must be balanced with the need to protect the individual's privacy. Government and business leaders are obligated to keep the privacy issue a priority as they develop the information systems that will form the backbone of America's e-learning future.

RECOMMENDATION TWO:

Implement new measures and methods for assessing and certifying what individuals know and are able to do.

The traditional, institution-based approach to credentialing individuals for completion of classes and programs of study is not a viable standard of measurement in an e-learning environment where learning is increasingly self-directed and comes from a wide variety of sources. Moreover, traditional educational credentials shed little light on precisely what an individual knows and is able to do.

In recent years, employers have invested a great deal of time and money in trying to define the competencies needed for successful performance in their companies. Similarly, policy makers and industry leaders have attempted to create systems of skill standards to communicate changing skill and certification requirements to students, workers and educators. In many cases, however, these processes proved too complex, cumbersome and inflexible.

The Commission believes that government and business must work together to create a more dynamic, learner-centered approach in which credentials are earned for demonstrated knowledge and skill, regardless of the source of the learning. In this learner-centered system, individuals will have to assume greater responsibility for keeping their skills current and for seeking the appropriate certifications. Therefore, we call on private and public sector leaders to:

- **Develop and promote outcome-based measures of what people know and are able to do.** Learning providers of all kinds, including post-secondary educational institutions, should be able to describe learning outcomes in ways that are more useful for learners and employers—and more compatible with e-learning and modular instruction. This means using credentials that describe what people know and are able to do rather than merely listing courses taken, programs completed or credits earned. Regulatory and licensing authorities in the education field should encourage the development of such competency-based credentials and grant them official recognition. In addition, business, government and individual learners should use information about providers' performance to leverage their education and training investments, including tuition reimbursement and financial aid dollars. The goal should be to reward providers who demonstrate results in helping people acquire needed knowledge and skills.

Western Governors University
An initiative of the Western Governors' Association, Western Governors University (WGU) began issuing competency-based degrees and certificates in 1998. WGU offers five degree and certification programs in areas from learning and technology to software applications analysis, with distance learning courses available via interactive television, satellites and the Internet. All credentials are transferable among degree and certificate programs, and competencies are updated regularly with input from business. (www.wgu.edu)

- **Develop fair and reliable assessment and certification methods.** Employer demands for a more highly skilled workforce, together with the advent of e-learning, have created a growing market for testing, assessment and certification of individuals' knowledge and skills by third-party organizations. To ensure fairness in this market, the public sector should join with the private sector in creating guidelines to ensure the integrity of the assessment and certification process. These guidelines should include a performance evaluation component to demonstrate learning results rather than focusing solely on the completion of or participation in various learning activities. Moreover, instead of relying exclusively on technology, results should also be measured with the aid of objective analysis by instructors and/or peers.

- **Create a universal and widely accessible electronic system that allows individuals and organizations to document learners' knowledge and skills.** Technology dramatically improves the ability of individuals, learning providers and others to create a reliable system for credentialing learning outcomes. Government and the private sector should support the development and implementation of a flexible electronic system that stores a variety of outcome-based information such as certifications, degrees and other demonstrations of competence. Individuals would use such a system to document information about themselves in portable, learner-specific "electronic portfolios" that, with the owner's consent, are accessible to employers and education and training providers. Government and business should work together to ensure the integrity and security of the system and protect the privacy of individuals and employers.

SCANS 2000
Career Transcript System

The SCANS 2000 Career Transcript System recognizes the importance of not only identifying necessary skills, but also providing a means of documenting and certifying those skills. The system is applying a number of innovations to the challenge of assessing and certifying what workers know and are able to do. These include: assessing SCANS competencies through new instruments that include supervisors' and teachers' evaluations as well as new standardized tests; maintaining a consistent database of assessment results; and issuing career transcripts that document acquisition of the SCANS competencies. (www.scans.jhu.edu/General/CTS.html)

RECOMMENDATION THREE:

Ensure broad and equitable access to e-learning opportunities.

Broad and equitable access to e-learning is only possible when an appropriate infrastructure is in place. This infrastructure includes high-speed telecommunications and connectivity for individuals and communities, as well as the high-quality software and curricula that contribute to effective e-learning.

While a growing number of Americans have the technology and the skills required to make the most of e-learning, many still lack access to these crucial stepping-stones that can help them succeed in the 21st-century economy. For example, 82 percent of Americans living in households with more than $75,000 in income now have Internet access, compared to 38 percent of those in households earning less than $30,000.[13] Furthermore, access to the broadband Internet services that give e-learning its revolutionary potential is significantly lower among all populations.

Challenges remain in building the hard infrastructure for e-learning, and continued work and investments are needed. In addition, a variety of real and potential attitudinal, cultural and structural barriers must be addressed in order to realize e-learning's potential for reducing the divide between the "haves" and "have nots" in this country. Therefore, we call on private and public sector leaders to:

- **Adopt common technical standards aimed at promoting open and equitable access while reducing development costs.** For e-learning to become widely accessible, consensus will have to be reached on shared technical standards for key features of the e-learning environment. Just as we needed agreement on a standard size for railway tracks to link the infrastructure of separate companies into an integrated national system, common standards for such things as metadata, learning objects and learning architecture will ease communications among different platforms, operators, providers, sites and individuals.

  Common standards also can help reduce the time and cost of producing high-quality content and applications by making it easier to share materials, tailor instruction to individual and situational needs, and transfer materials across technology without significantly changing their content and format. Standards already exist; the challenge is for government and business to adopt consensus standards and then to use those standards to help shape a vibrant e-learning sector. This must be done in an environment that is open, competitive and free of inhibiting regulations.

Advanced Distributed Learning Initiative

Led by the U.S. Department of Defense, the Advanced Distributed Learning Initiative includes government organizations, more than 1,600 colleges and universities, and more than 150 corporations that have come together to develop an open architecture for online learning. Responding to the fact that several organizations were developing draft standards that lacked a common framework, the project partners incorporated many of the emerging standards into one content model. The Sharable Content Object Reference Model (SCORM) is a set of technical specifications that enable sharable, durable and reusable learning content. (www.adlnet.org)

As common standards are adopted, one priority should be to create "warehouses" of frequently used digital objects. This would facilitate sharing and reuse of content across learning providers while promoting broader access to high-quality e-learning.

Government and business also should embed voluntary standards in their procurement practices. This would provide incentives for developers of content, software and operating systems to employ these standards in the development of e-learning resources.

- **Create conditions that favor e-learning and eliminate barriers that inhibit people from engaging in e-learning.** Policies and practices that helped expand access and assure quality in a more static economic and educational environment can now be barriers to broader participation in e-learning and the development of e-learning content. These include: uncertainties about intellectual property issues; tuition reimbursement and other programs that fund workforce education only at traditionally accredited institutions; public support for workforce and post-secondary education that favors investments in "bricks and mortar" over infrastructure to support e-learning; and financial aid policies. An example of current policies and programs that need to be reviewed and updated is the federal government's Pell grant system, which disburses $6.5 billion to 3.8 million students each year. The problem is that Pell grant rules currently make it difficult for individuals to engage in e-learning—for example, by requiring students to be enrolled in higher education institutions that offer less than half their courses online. Working closely with the private sector and learning providers, government should review and update these policies so they appropriately support the continued development and growth of e-learning.

Riverside (CA) Computer Investment Program

The Computer Investment Program in Riverside, California, helped 145 low-income households acquire computers in its first year. The program also arranges for free computer training classes, 90 days of free bilingual phone tech support, free Internet access, and free warranties for all participants. A public-private partnership between the City of Riverside, the county Credit Union, Jaguar Computers, and the Riverside Community Online Project, the program provides subsidies of $225 for qualified low-income families to purchase PCs while ensuring that their monthly loan payments stay below $20. The credit union finances the loans at reduced interest rates and waives prior credit history requirements. (www.govtech.net/magazines/story.phtml?id=2530000000001593)

Practices and policies within firms also have presented barriers that inhibit wider participation in e-learning. Recent research has shown that 60 percent of individuals who engaged in employer-provided e-learning outside of work hours would have preferred to learn at work. Another problem involves generic, one-size-fits-all e-learning courses that do not match varying learning styles, course content, and organizational cultures. These types of practices tend to provide less satisfying e-learning experiences and, in turn, discourage learners from engaging in e-learning.[14]

- **Provide incentives and foster public-private partnerships to promote broader access to e-learning among underserved communities.** Government incentives can be targeted to individuals (e.g., subsidized access) or to businesses that invest in developing e-learning infrastructure at the community level. In addition, government and business should continue their own investments in the infrastructure of diverse communities. Priorities for investment should include: culturally customized learning portals that help people navigate the Internet and access learning resources; community learning centers that provide opportunities for participation in support services including training, mentoring, peer support and information; cognitively sound and engaging content demonstrated by results; and effective learning management systems. As an early action step, government should consider providing seed funding for regional, state and local purchasing pools. These purchasing pools would support the acquisition of innovative learning software that has demonstrated success in teaching the basic skills that are vital in enabling individuals to take advantage of e-learning opportunities.

Colorado Telecommunications Infrastructure Fund

In 1999, Colorado legislators passed two measures designed to improve the state's telecommunications infrastructure and extend its reach to underserved communities. The first is a statewide voice, data and video network serving state offices. This Multiuse Network pools state agency telecom traffic with the goal of providing a market incentive to private providers to set up high-speed connection points mostly in county seats. The second initiative is the Colorado Telecommunications Infrastructure Fund, which provides state grants to communities so they can create local connection points to the high-speed network. (http://ruraltelecon.org/beanpole)

- **Provide leadership in demonstrating the power of e-learning for individuals and communities.** Government and business are in a powerful position to demonstrate the evolving possibilities of e-learning in the digital age. An important initial step is to provide employees with online access to information that can help them solve problems and enhance their performance at work. Another strategy is to help customers and suppliers develop e-learning skills as they use technology to interact with government and business entities on a day-to-day basis. These activities create broader familiarity with, and acceptance of, e-learning while providing the foundation for larger-scale efforts.

@ccessWashington

@ccess Washington is Washington State government's portal site where citizens can find links, referrals and search potential for a variety of government services and resources. Linked resources include e-learning and distance education programs in public 2- and 4-year colleges and universities, as well as private colleges. @ccess Washington also helps citizens practice the computer literacy skills needed for successful e-learning. In addition, the portal sets a highly visible standard for other online information providers while creating an expectation among citizens that government—and learning—services should be accessible and conducted online. (http://access.wa.gov)

- **Use the "bully pulpit" to speak out on behalf of e-learning.** Corporate CEOs and governors should also promote broader acceptance and support for e-learning by simply speaking out. In communications with constituents, employees, community organizations, and other business and government leaders, CEOs and governors should take advantage of every opportunity to explain what e-learning is, why it is important, and what it will take for individuals and communities to realize its full potential. CEOs and governors also can and should lead by example, using e-learning to master important topics and skills.

The Cisco Field E-Learning Connection

The Field E-Learning Connection represents the first major effort at Cisco to provide a centralized Web-enabled learning location for the company's global field team to track and manage skill and knowledge development. The site links to more than 500 Web-based and leader-led training courses, online labs, assessment exams, learning plans and histories, and role-based learner roadmaps. (www.cisco.com/warp/public/779/ibs/solutions/learning/practices)

Conclusion

The Commission on Technology and Adult Learning encourages governors, CEOs and other leaders to make e-learning the cornerstone of a national effort to develop a skilled workforce for America's digital economy. The challenge for businesses is to realize the full potential of e-learning as a driver of productivity and performance gains by making it an integral part of organizational strategy and operations. For government, the challenge is to create a nurturing policy environment for e-learning—first, by removing barriers that restrict access to e-learning's benefits and, second, by promoting industry self-regulation while balancing citizens' interests and needs.

By embracing e-learning in our states, our communities and our organizations, we can improve our competitiveness and point the way to a new era of unprecedented growth and opportunity for all Americans. The recommendations we have laid out in this report provide governors, CEOs and others with a roadmap to revolutionary improvements in how America learns.

ENDNOTES

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ASTD is the world's leading association for workplace learning and performance professionals, forming a world-class community of practice. ASTD's 70,000 members come from more than 100 countries and 15,000 organizations—multinational corporations, medium-sized and small business, government, academia, consulting firms, and product and service suppliers.

Started in 1944 as the American Society of Training Directors, ASTD is now a global force, widening the industry's focus to connect learning and performance to measurable results, and is a sought-after voice on critical public policy issues.

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